

# Somerset Berkley Regional High School

---

Robotics Engineering with LabView

**Objective: To support the development of metacognitive skills and habits of reflection for effective problem solving**

**Planning ; What should step one be? What do I know about the problem?**

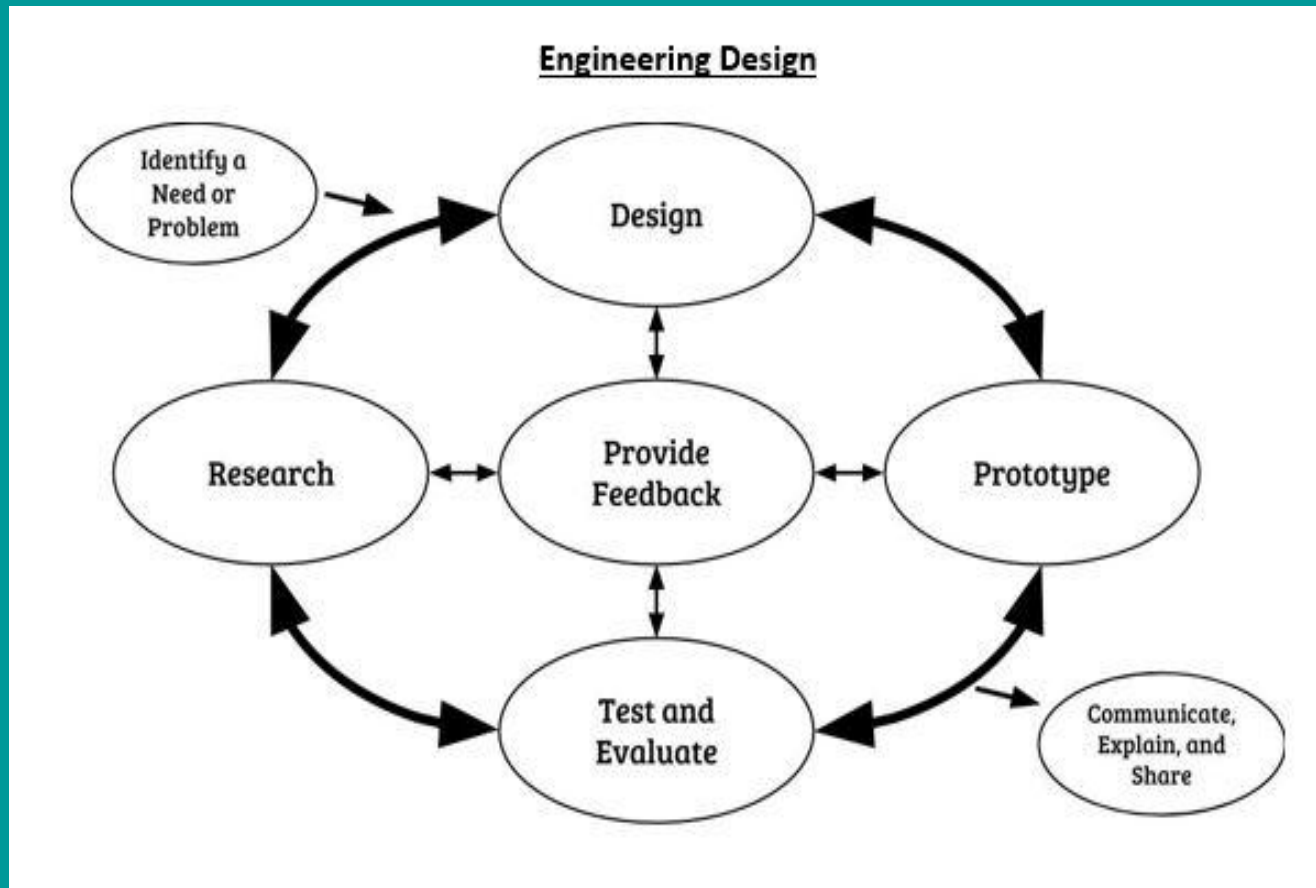
**Goal setting Set realistic goals. How much time do I have?**

**Monitoring progress Am I on the right track?**

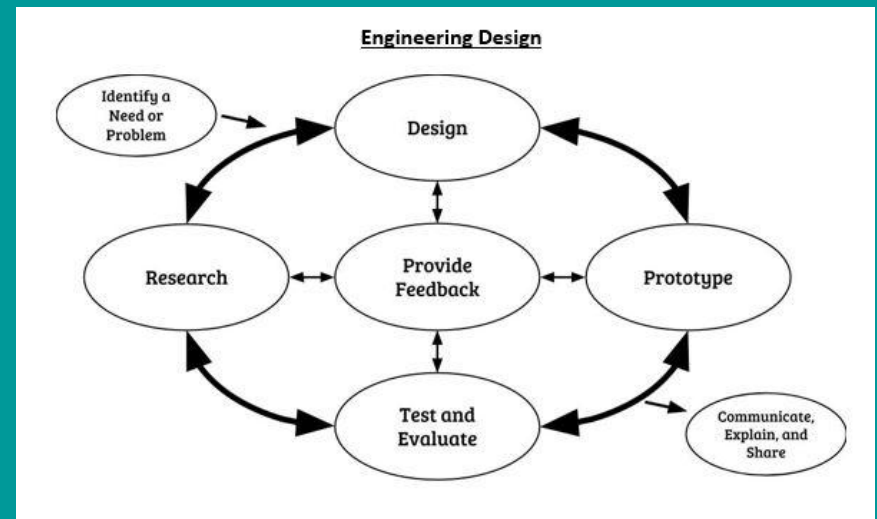
**Adjusting What did I learn. Did I get the results I was expecting?  
If I could do this over again I would.....**

# Standard 1.1 Engineering Design Process

2016 Revised Massachusetts State Framework



Identify the need or problem



**Identify a need or a problem.** To begin engineering design, a need or problem must be identified that an attempt can be made to solve, improve and/or fix. . This typically includes articulation of criteria and constraints that will define a successful solution.

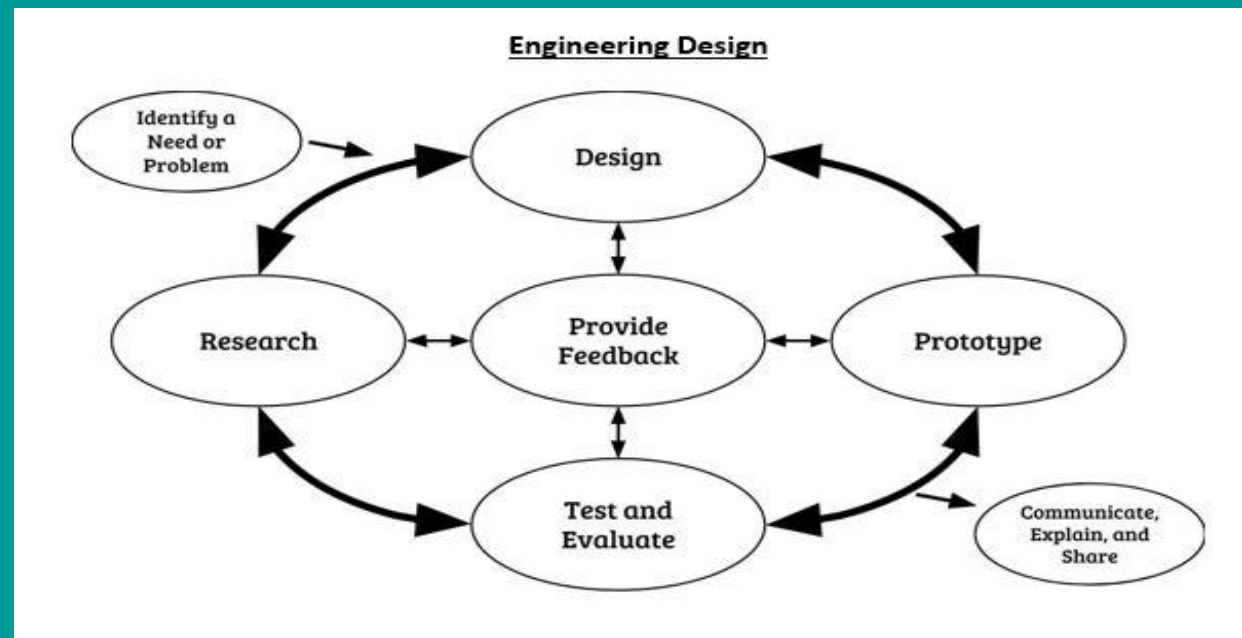
**Evidence** : Add slide and describe what you already know about the problem. This helps to build an understanding of the problem

**Describe the knowledge you will need or think you will need to solve this problem.**

# Problem

While making this robot the only problem we identified was the weight distribution the back of our bot was too light and it needed more weight. I realized this was a problem when the back wheels would stutter. The solution we needed was to give that side more weight. we figured this out by pushing down on the end and it would go up the ramp perfectly.

Research the problem



**Research.** Research is done to learn more about the identified need or problem and potential solution strategies.

Decide what information is needed.

What should step one be?

Use appropriate tools and strategies to access the information

Analyze the information gathered and its sources.

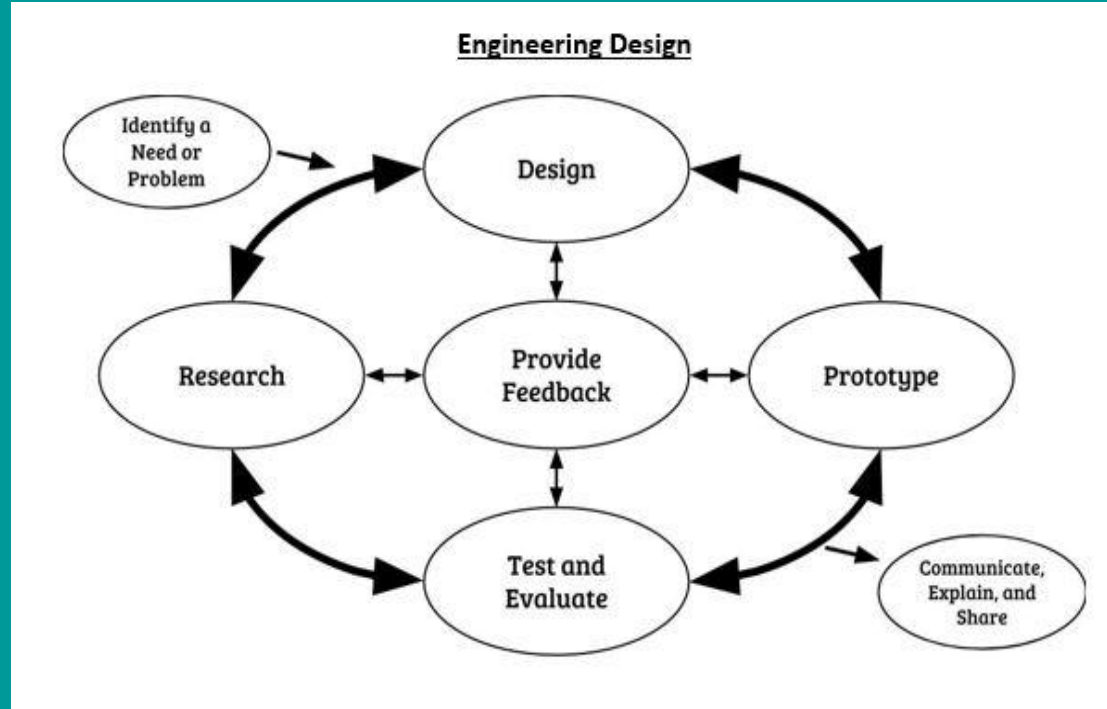
If there is more than one good answer to the problem,

*On your PowerPoint file show add a slide to show what you did for research. **Evidence***

# Evidence

<https://youtu.be/gZ2bcYhhKN0>

# Design



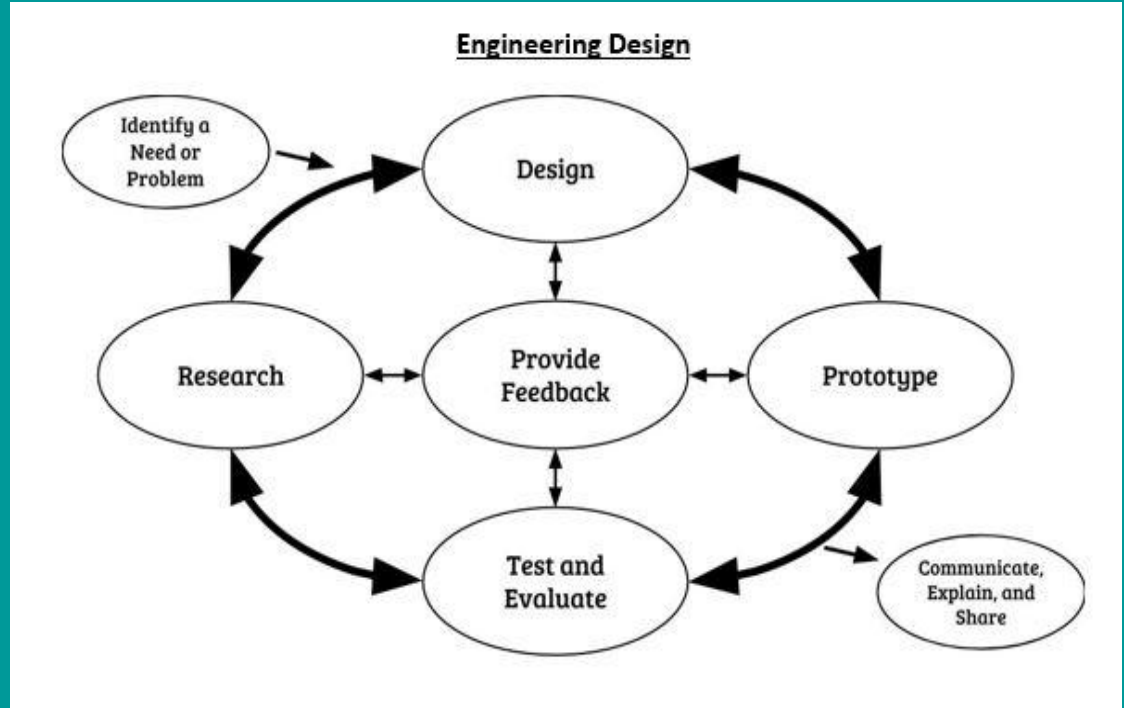
**Design.** All gathered information is used to inform the creations of designs. Design includes modeling possible solutions, refining models, and choosing the model(s) that best meets the original need or problem.

**Evidence**: Clarify the roles of each team member, taking advantage of individual strengths.  
List the role of each member on the team



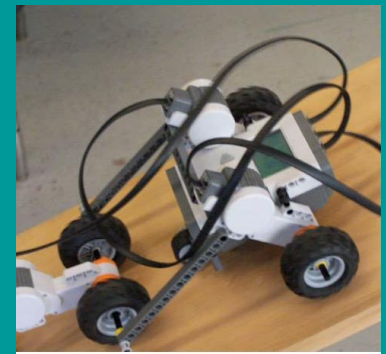
For both members of our team we both were designers and researchers as we shared the roles evenly.

# Prototype



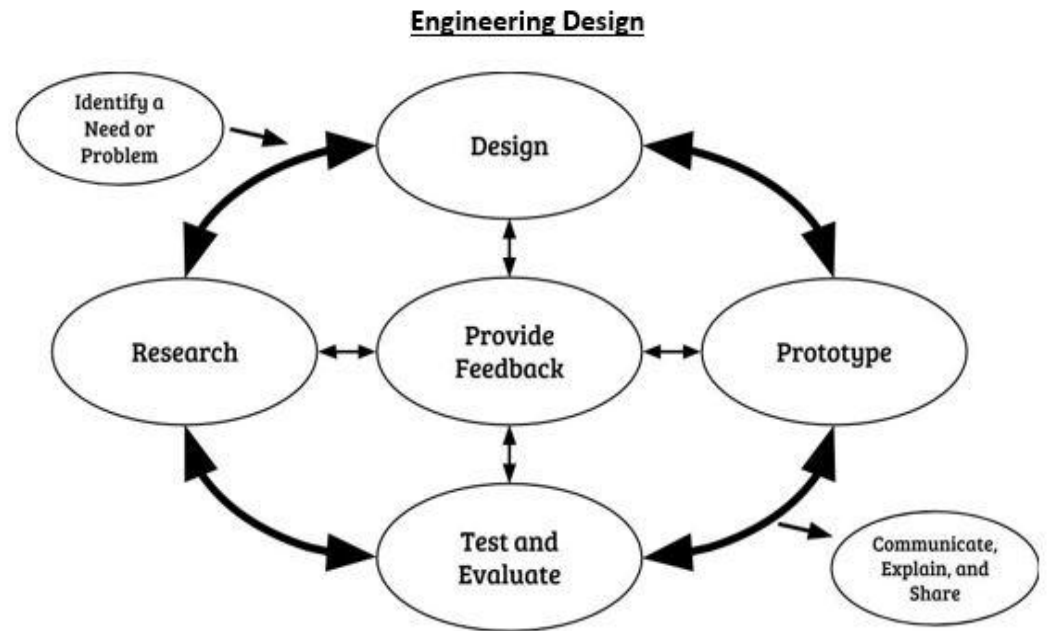
A prototype is constructed based on the design model(s) and used to test the proposed solution. A prototype can be a physical, computer, mathematical, or conceptual instantiation of the model that can be manipulated and tested.

**Evidence** : Execute the plan, (build your robot) modifying as needed.





# Test and evaluate



The feasibility and efficiency of the prototype must be tested and evaluated relative to the problem criteria and constraints.

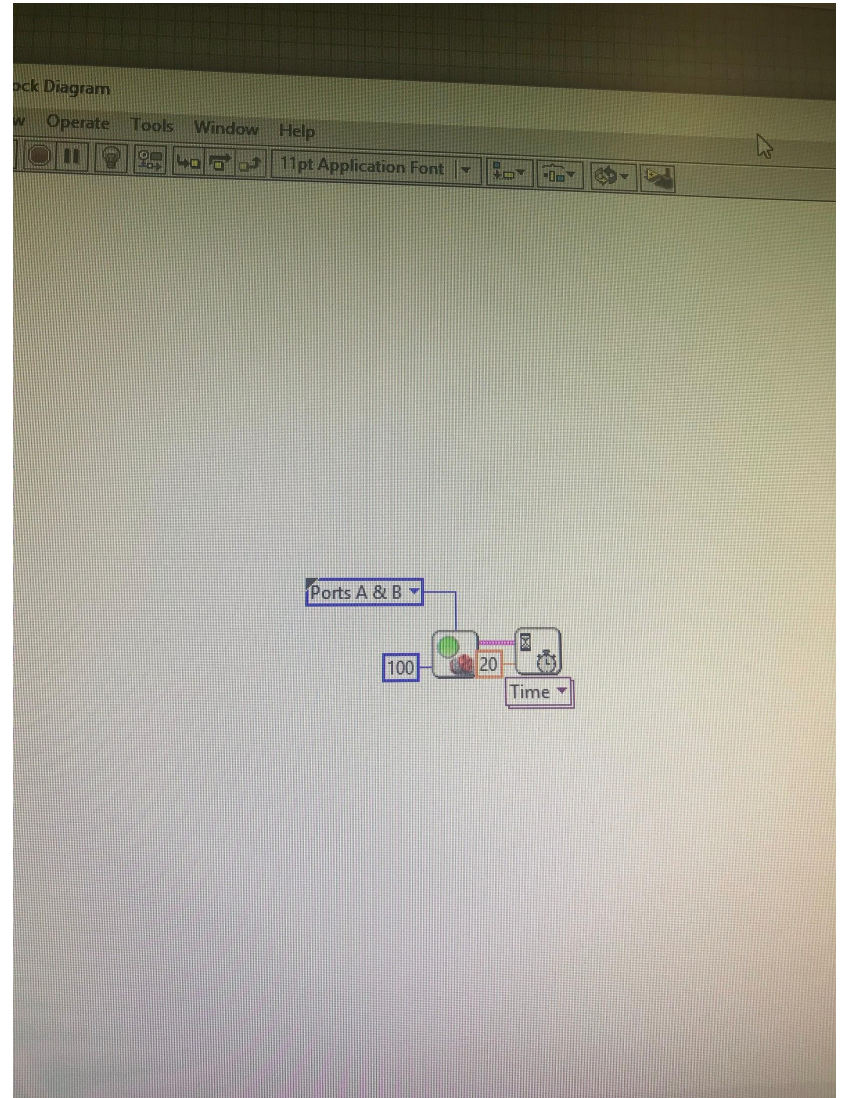
Collaboratively decide whether the solution needs more work and repeat previous phases as needed.

- Does your robot work?
- Did it perform as expected?
- What changes are necessary for the robot and the program?
- Does it meet the original design constraints?
- Is it safe?
- Students present their solution to the other teams and celebrate the work of the problem solvers

- The Robot does Work
- It did perform as expected
- I needed to add torque and wheels to the robot
- It met the original design constraints
- It is safe

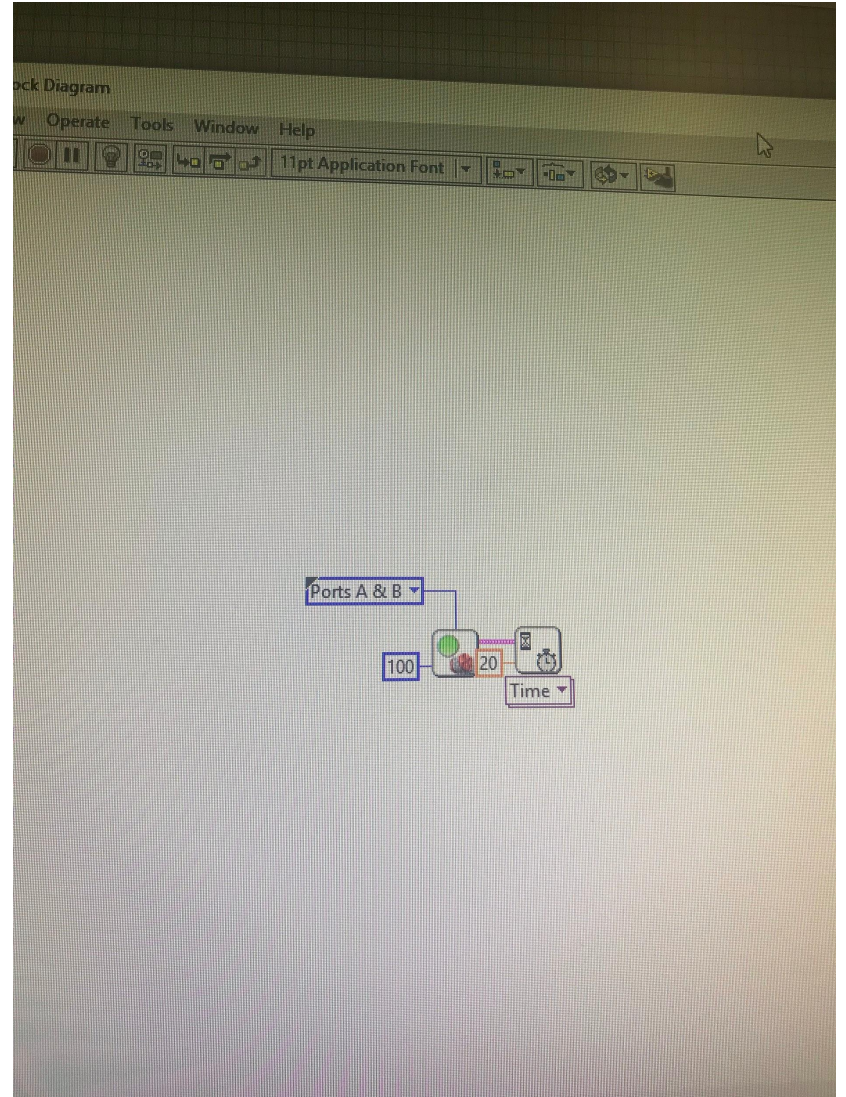
# Evidence

modified prototype picture and computer program



# Evidence

Prototype picture and computer program



Communicate the solution(s)

Provide the YouTube link of your video that shows how your robot meets the challenge.

Ramp stage 1

Ramp Stage 2



## Reflection

Think about your professional destination. What skills and or knowledge are you going to need that you don't have or have enough of. Add a slide and make a list  
Reflect on your latest assignment in robotics and describe how what you just did supports what is on your list.

# Reflection

Throughout this project one thing that i learned is that there will be many failures but you need to overcome those and to keep working on finding a solution to make things work out.

# Letter to a future student

Take a few minutes to think of a time when you overcame a struggle in robotics class.

Reflect on the times when you failed at first but through persevering you eventually became better at the task at hand and succeeded. Briefly describe this experience in a letter to a future robotics student.

## **What metacognitive strategies are you using?**

I am able to figure out how i am failing at the project and use that to make sure next time won't be the same way.

## Instructions for posting to Weebly

1. Go to file->download file and then choose PDF document (.pdf).
2. Then on your weebly website under Build Media section drag the file option and upload the PDF of your Slides presentation to your website

References Faculty Focus .Com  
Khan Academy  
Massachusetts 2016 frameworks